

Tatiana V. Karpinets

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Date of Birth: February 16, 1958.
Place of Birth: Kursk, Russia

EDUCATION

Degree	Institution	Date	Field
High education (M.S.) (with honors)	Kharkov State Univ. (Ukraine), Department of Biophysics	1980	Biophysics
Candidate of Science (Ph.D.)	All-Russian Scientific Research Institute (Moscow, Russia)	1989	Biological Sciences

Others:

Fundamentals of Computational Biology - Wright State University, Dayton, OH, 2003.

Computer programming course on database development - Kursk Technical University, Kursk, Russia, 1991.

Kursk school of Math and Physics (with honors) - Kursk, 1975.

POSITIONS AND EXPERIENCE

Experience in Gene Array Technology, Bioinformatics and Computational Biology

*February 2002- February 2004: **Postdoctoral Scientist.** Department of Physics, Wright State University, OH, USA.*

- Analysis of the experimental data obtained by Affymetrix chips (Rat Toxicology U34 and Human Genome U133) using hierarchical clustering, self-organizing maps, principal component analysis and other pattern recognition methods (**Perl at Unix platform, GeneSpring 4.2.1 SPSS; MatLab; Visual Basic for Application in Excel and Access**).
- The development of software in **MatLab** and **Excel VBA** to analyze gene expression data sets obtained in toxicological experiments. The paper has been published in the "Bioinformatics" (Karpinets et al., 2004).
- The biological annotation of genes involved in toxic response; the development of a knowledgebase in Access on the basis of the collected information. The database is available at the Internet at <http://www.wright.edu/~tatiana.karpinets/>.
- The development of a model of tumorigenic transformation in mammalian cells. This model reveals (at the level of involved pathways and genes) the role of sustained stress and replicative senescent in tumorigenesis. A paper has been published in the "Journal of Theoretical Biology" (Karpinets & Foy, 2004). In the other paper (submitted for publication) we consider tumorigenesis as a gradual process of the adjustment of mammalian cells to sustained stress by means of epigenetic alterations in the genome and following matched mutations in oncogenes (Karpinets & Foy, 2004).

2003 - present: **Reviewer for “Bioinformatics”** (9 reviews by now; the date of the last review is 10 November 2004)

(More information is at the website <http://bioinformatics.manuscriptcentral.com>, log in with *User Name*: tatikarpinets; *Password*: bioinf371601 and then click “Reviewer Center” button).

Experience in Modeling of Biological Systems, Software Development, Data Management and Mathematical Statistics

February 2004-present: **Adjunct Professor**. Department of Plant Sciences, University of Tennessee, Knoxville, TN, USA.

- Analysis of cellular mechanisms involved in adaptation of soil microbial community to stressful environment. Development of a model of stationary state mutagenesis in bacteria.

1991-2001: **Senior Research Officer and then Chief Scientist on Modeling Biological Systems**, All-Russian Scientific Research Institute of Agriculture. Kursk, Russia.

- Development of Plant and Soil Response Models (Russian and English versions); simplified versions of the models runs on the Internet at: <http://www.qpais.co.uk/phosmod/phos.htm> and <http://www.qpais.co.uk/moda-djg/potass.htm>. (See [Authors and Programmers](#) at the website)
- Development of Computer Decision Support System for management of natural resources. Grant sponsored research of Food Corporation, Russia (Fox Pro).
- Development of Nutrient Management System for Agricultural Crops in Chernozemic region of Russia Grant sponsored software for the State Advisory Service in Belgorod Province of Russia (Fortran; Basic).
- Development of Data Management system for ecological monitoring. Grant sponsored research of the Ecological Committee of Kursk province (FoxPro).
- Development of a novel technique for decreasing cesium availability for plant
- Data management and statistical analysis of the experimental results using Excel; SPSS; STATGRAPHICS and other software.

INTERNATIONAL AWARDS

1992 International Potash Institute Award

1997 Japanese Society of Plant Nutrition Award

1998 British Council of Biotechnology and Biological Research

2001 German Society of Plant Nutrition Award

2002 Kursk Chamber of Commerce and Industry Award

MAIN PAPERS PRESENTED

IN ENGLISH:

1. Karpinets T.V., Foy B.D. 2004. Tumorigenesis: Adjustment of mammalian cells to sustained stress by epigenetic alterations and following matched mutations in oncogenes *J. of Theoretical Biology* (Submitted for publication).
2. Karpinets T.V., Foy B.D. 2004. Model of the developing tumorigenic phenotype in mammalian cells and the role of sustained stress. *J. of Theoretical Biology*, 227/2, 253-264.
3. Karpinets T.V., Foy B.D., Frasier J.M. 2004. Tailored gene array databases: Applications in mechanistic toxicology. *Bioinformatics*, 20(4), 507-517.
4. Karpinets T.V., Greenwood D. J. and J. T. Ammons. 2003. Predictive Mechanistic Model of Soil P Dynamics with Readily Available Inputs. *Soil Sci. Soc. Am. J.*, 68, 644-653.
5. Karpinets T.V., Greenwood D.J. 2003. Potassium Dynamics. In "Handbook of Processes and Modeling in the Soil-Plant System". The Haworth Press, Inc. p.525-560. <http://www.haworthpress.com/store/product.asp?sku=4774&AuthType=>
6. Karpinets T.V., Ammons J.T. 2001. Cesium blocking technique for decreasing its availability for plant. In *Proceedings of Sixth International Conference on the Biogeochemistry of Trace Elements*. Guelph, Ontario, Canada, p. 481.
7. Karpinets T.V., Greenwood D.J., Stone D.A., 2001. Modelling the effects of soil and fertilizer-P on crop growth, P-uptake and soil-P in arable farming. In *Proceedings of XIV International Plant Nutrition Colloquium "Plant Nutrition - Food Security and Sustainability of Agro-Ecosystems through Basic and Applied Research"*, Kluwer Academic Publishers, pp. 602-603.
8. Greenwood D.J., Karpinets T.V., Stone D.A., 2001. Dynamic model for the effects of soil-P and fertilizer-P on crop growth, P-uptake and soil-P in arable cropping: model description. *Annals of Botany* 88(2), pp.279-291.
9. Greenwood D.J., Stone D.A., Karpinets T.V. 2001. II. Dynamic model for the effects of soil-P and fertilizer-P on crop growth, P-uptake and soil-P in arable cropping: experimental test of the model for field vegetables. *Annals of Botany* 88(2), pp.293-306.
10. Broadley M. R., Escobar-Gutierrez A. J., Fermor T. R., Gerzabek M. H., Hall S. C., Karpinets T. V., Marmiroli N., Strebl F., White P. J. and Willey N. J. 2000. Phytosystems for managing European sites contaminated with radioisotopes of Cs. In the Meeting "Remediation of toxic metals by phytoextraction and phytostabilization - What is needed to make it work". Parma, IT, p.22-25. (http://lbewww.epfl.ch/COST837/WG2_progress.html#Parma).
11. Moukha V.D., Sulima A.F., Karpinets T.V., Levshakov L.V. 1998. The ratio between heavy metal contents in soil and parent rock as a criterion for evaluation soil contamination. *Eurasian Soil Sci.*, 31/10, 1146-1150.
12. Karpinets T.V., D.J.Greenwood. 1997. Modeling and measurement of the effect of K-fertilizer on yield, crop uptake and soil-K In *Proceedings of XIII International Plant Nutrition Colloquium "Plant nutrition for Sustainable Food Production and Environment"*, p.499-500.
13. Greenwood D.J., Karpinets T.V. 1997. Dynamic model for the effect of K-fertilizer on crop growth, K-uptake and soil-K in arable cropping. 1. Description of the model. *Soil Use and Management*. 13, p. 178-183.
14. Greenwood D.J., Karpinets T.V. 1997. Dynamic model for the effect of K-fertilizer on crop growth, K-uptake and soil-K in arable cropping. 1. Field test of the model. *Soil Use and Management*. 13, p.184-189.
15. Karpinets T.V.1995. Determination of stable stationary contents of forms of potassium in soils. *Eurasian Soil Sci.* 27/9.p.88-97.
16. Karpinets T.V.1993. Estimation of K fixation and release by two consecutive extractions. *Potash Review*. 1, p. 29-33.
17. Karpinets T.V., Lipkina G.S. 1992. Stable Steady States of the Potassium Regime in Soil. *Eurasian Soil Sci.*24/7.,p.9-17.
18. Karpinets T.V.1992. Estimation of K fixation and release in soil by two consecutive methods. In *Proceedings of 23rd Colloquium of IPI "Potassium in Ecosystems"* Czechoslovakia, October 12-16. Prague,p.391-394.

IN RUSSIAN:

A. Publications in Journals and Bulletins:

19. Karpinets T.V., Dubovik D.V. 2001. The effect of different combination and sequences of nitrogen, phosphorous and potassium folia applications at the late stages of winter wheat growth on the grain quality. *Agricultural chemistry*. 4, p. 22-27.

20. Karpinets T.V., Chuyan G.A., Prokoshev V.V. 2000. The Potassium Fertilizers' Marketing. Agrochemical bulletin. 5. 38-41.
21. Karpinets T.V. 2000. The use of results of long-term field trials with fertilizers for numeric estimation of steady stationary contents of soil phosphorous and potassium. In "Modern Problems of Good Experimental Practice". Materials of the International Scientific and Practical Conference in St. Petersburg, p. 35-40.
22. Chuyan G.A., Karpinets T.V. 1999. Agricultural recourses in collective farms of Kursk province. Agriculture. 1, p. 17.
23. Moukha V.D., Sulima A.F., Karpinets T.V., Levshakov L.V. 1998. Estimation of the soil pollution with heavy metals by the ratio between their contents in the parent rock and in the soil. Pochvovedenie. 10, p. 1265-1270.
24. Karpinets T.V. 1994. Estimation of steady stationary potassium contents in soils. Pochvovedenie.10, p.93-98.
25. Karpinets T.V., Lipkina G.S. 1992. Steady Stationary States of the Potassium Regime in Soil. Pochvovedenie.3, p.61-68.
26. Karpinets T.V., Chuyan G.A. 1990. A possible approach to get a theoretical relationship between the crop yield and available potassium and phosphorous content in soil. Scientific Research Bulletin of All-Russian Institute of Agriculture and Soil Erosion. 1, p.31-37.
27. Chuyan G.A., Karpinets T.V. 1988. Creation and Maintenance of a given K status in chernozems in consideration of their fixation ability. Scientific Research Bulletin of All-Russian Institute of Agriculture and Soil Erosion Control. 57/2, p. 3-8.
28. Chuyan G.A., Boichenko Z.A., Karpinets T.V. 1987. Technical approaches to the management of agrochemical parameters of soil fertility. Scientific Research Bulletin of All-Russian Institute of Agriculture and Soil Erosion.53/2, p.40-44.
29. Chuyan G.A., Karpinets T.V. 1986. Some features of K accumulation in chernozemic soils. Scientific Research Bulletin of All-Russian Institute of Agriculture and Soil Erosion Control. 49/2, p. 48-52.

B. Monographs

30. Handbook for the development of computer advisory system on fertilizer application. 2001. Publishing house of Yumeks. Kursk. (Composite authors).
31. Method of soil and erosion investigations. 1998. Publishing house of Yumeks. Kursk. (Composite authors).
32. Models for management of productivity of landscape. 1998. Publishing house of Kursk State Agricultural Academy. Kursk. 215 p. (Composite authors).
33. The development of systems of fertilizer in rotation. 1996. Publishing house of Kursk State Agricultural Academy. Kursk. 103 p. (Composite authors).
34. System of management of soil fertility in Central Chernozemic Zone of Russia. 1996. Publishing house of Kursk State Agricultural Academy. Kursk. 136 p. (Composite authors).
35. Principles of the development of the systems of agriculture on the landscape bases. 1996. Publishing house of Kursk State Agricultural Academy. Kursk. 132 p. (Composite authors).
36. Landscape Agriculture. Part I.1993.Kursk. Russian Academy of Agricultural Sciences, 98 p. (Composite authors)
37. The concept of creating a highly productive ecologically stable agrolandscapes and improvement of agricultural systems on the landscape bases.1992. Kursk. Russian Academy of Agricultural Sciences,138 p.(Composite authors).

C. Patents

38. A Method of cropping of winter wheat. Patented in Russia, N2146438 from 20.03.2000 (19) RU (11) (13) C1.
39. A Method of indication of the soil pollution with chemical elements. 1997. Patented in Russia, N208491 from 20.07.97 (19) RU (11) (13) C1.
40. A Method of the creating of a given K status in soil. Patented in the USSR, N1374130 from 07.04.86. (51) 4 G 01 N33/24.

D. Thesis and Dissertation:

41. Karpinets T.V. 2000. Simulation of Potassium Regime in soil-plant system. Dr. of Science Dissertation. 293p.
42. Karpinets T.V. 2000. Simulation of Potassium Regime in soil-plant system. All-Russian institute of agriculture and soil erosion control. Kursk. Abstract of Dr. of Science Dissertation. 37p.
43. Karpinets T.V. 1989. The optimization of potassium regime in eroded typical chernozems of Russia. PhD

thesis.

44. Karpinets T.V. 1989. The optimization of potassium regime in eroded typical chernozems of Russia. All-Union Institute of Agriculture and Soil Science. Moscow. Abstract of PhD thesis.

I. Published Abstracts:

45. Karpinets T.V., Chuyan G.A., Greenwood D.J. 2000. The estimation of steady stationary states of phosphorous regime in chernozems. In Proceedings of 3rd Dokuchaev Soil Science Society Soils Congress in Suzdal, Russia, p.126.

46. Chmolenko M.I., Aidiev Yu. A., Boeva N.N., Karpinets T.V. 1998. The dependence of yield and quality of winter wheat on weather conditions and on the rates of mineral and organic fertilizers at typical chernozem of Central Chernozemic Zone. In Proceedings of All-Russian Meeting of Geographical Net of Long-Term Field Trials with Fertilizer and other Chemicals. Moscow, P.100-101.

47. Chuyan G.A., Karpinets T.V. 1998. Automatic system on driving crop nutrition for personal computers. In Proceedings of scientific and practical conference, Kursk, p.93-96.

48. Moukha V.D., Sulima A.F., Karpinets T.V., Levshakov L.V. 1998. Estimation of the natural content of heavy metal on the polluted soil. In Proceedings of All-Russian scientific conference "Anthropogenic degradation of soils and ways of their prevention". Moscow, p.169-170.

49. Karpinets T.V., Chuyan G.A. 1997. A Method of cropping on the cesium-polluted soils. In Proceedings of scientific-and-production conference in Kursk, p. 42.

50. Karpinets T.V., Bondareva K.G. 1996. The programming of yield crops in actual practice. In Proceedings of conference "The Use of active teaching technologies in high education". Publishing house of Kursk State Agricultural Academy. Kursk, p. 60-62.

51. Bobilev B.C., Karpinets T.V., Veretennikov N.G. 1996. The use of computer in curriculum on feed production. In Proceedings of conference "The use of active teaching technologies in high education". Publishing house of Kursk State Agricultural Academy. Kursk, p.15-17.

52. Karpinets T.V. 1996. A Method for Prediction the changes in potassium forms in soils. In Proceedings of 2nd Dokuchaev Soil Science Society Soils Congress in Saint Petersburg, Russia, Book 1, p.350-351.

53. Karpinets T.V., Vidulina T.D. 1995. A possible way of decreasing of cesium accumulation in crop production. In Proceedings of conference devoted to the 25th anniversary of the All-Russian Institute of Agriculture and Soil Erosion Control. Kursk, p. 12-13.

54. Karpinets T.V., Kiselev Yu. V. 1995. Database of the operated parameters for the agroecological monitoring. In Proceedings of conference devoted to the 25th anniversary of the All-Russian Institute of Agriculture and Soil Erosion Control. Kursk, p. 44-45.

55. Moukha V.D., Sulima A.Ph., Karpinets T.V., Levshakov L.V. 1995. A new method of estimation of geochemical pollution of soils with heavy metals. In Proceedings of the International Symposium "Modern Ecological Problems of Province", Kursk, p.170-171.

56. Chuyan G.A., Karpinets T.V. 1995. Database for agroecological monitoring of soils in Kursk Province. In Proceedings of the International Symposium "Modern Ecological Problems of Province", Kursk, p.269-269.

57. Chuyan G.A., Boichenko Z.A., Karpinets T.V. 1994. Ecological Expertise of agricultural systems on the pollution of runoff with nutrients. In Proceedings of the conference "Ecological Problems of Agriculture", Voronezh, p.51-53.

58. Karpinets T.V. 1988. The establishment of a given level of potassium in soil taking into account its fixation ability. In Proceedings of conference "Role of young scientists in the development of agriculture", Sverdlovsk, p.21.

59. Karpinets T.V. 1988. Optimal levels of mobile potassium and phosphorous in typical chernozems of different fertility status. In Proceedings of the conference "Problems of the increasing of soil fertility in the intensive agriculture". P. 55-56.

60. Boldireva (Karpinets) T.V. 1982. Modeling of the fixation of available K in eroded soils. In Proceedings of All-union School of Young Scientist, Moscow, p.70-71.

61. Sterpin L.D., Pogorelov A.S., Boldireva (Karpinets) T.V. 1982. The relationship between structure and activity for radioprotectors of aminothiolic structure. In Proceedings of the Symposium "Perspectives of bioorganic chemistry in creating of new medical products", Riga, p.204.